

REMARKS/ARGUMENTS

In the outstanding Office Action, all of the claims 35 – 77 have been rejected based on the combination of Yano et al (U.S. Patent 5,747,800) in view of Gregory et al (WO 98/50941) in further view of general knowledge in the art. In general, these patent documents were known to the applicant as they were presented in information disclosure statements filed in this case. As will be discussed in detail below, it is respectfully submitted that the claims in the present application cover aspects of mass spectrometry not disclosed or suggested in this prior art, either taken alone or in combination.

Initially, it should be noted that the present invention is concerned with providing a mass spectrometer which incorporates a lens that can operate in both high and low sensitivity modes in order to alter the focused nature of a beams of ions directed to a mass analyzer. More specifically, as covered by independent claims 35 and 54, a lens, which is located downstream of an ion source and upstream of a mass analyzer, can operate in both a high sensitivity mode and a low sensitivity mode. In the high sensitivity mode, the lens focuses a beam of ions received from the ion source. In the low sensitivity mode, the lens defocuses the beam of ions which causes only a fraction of the ions to pass through slit or aperture 10 so as to not saturate the analyzer. The lens is switched from the high sensitivity mode to the low sensitivity mode based on a determination that particular mass peaks in a mass spectrum are saturating or approaching saturation and mass peaks within a particular mass range in a mass spectrum are saturating or approaching saturation.

The Yano et al patent is generally directed to a three-dimensional quadrupole mass spectrometer and the Examiner relies generally on Figures 1B and 1C stating they show different sensitivities of a lens. Yano et al. actually teaches to employ a lens, defined by electrodes 3-5, which assures that the amount of ions directed to the quadrupole mass spectrometer does not exceed a certain level. That is, there is a certain amount of space 11 available in the Yano et al. quadrupole mass spectrometer. To control a saturation level, the amount of ions must be controlled. The Gregory et al

document is being relied upon by the Examiner to address the limitation that "particular mass peaks in a mass spectrum are saturating or approaching saturation and mass peaks within a particular mass range in a mass spectrum are saturating or approaching saturation" (see page 3 of the Office Action in the last paragraph). However, Gregory et al actually employs a very sensitive detector such that the intensity of ion fluxes must be controlled to prevent overload of an electron multiplier, i.e., the ion beam intensity incident on the detector is dynamically modified. In any case, neither of these prior art arrangements is concerned with switching a lens between high and low sensitivity modes by looking at mass peaks in a mass spectrum in a manner analogous to the present invention. Therefore, at best, the relied upon prior art alters a flow of ions to control the amount of ions to an analyzer, whereas the present invention is specifically concerned with looking at the mass spectrum and particularly mass peaks in connection with controlling the switching of the lens from the high sensitivity mode to the low sensitivity mode. Based on this significant distinction, it is respectfully submitted that the applied prior art does not disclose or suggest the invention set forth in these claims.

Independent claims 55 and 77 require a lens in a mass spectrometer to be regularly switched back and forth between high and low sensitivity modes. As clearly disclosed in the present application, this repeated switching back and forth between the two sensitivity modes results in multiple data sets for the analyzer, with the multiple data sets being able to enable ready compensation if any given data set is corrupt due to saturation. That is, these claims cover the aspect of switching the lens back and forth between the high and low sensitivity modes without waiting for peaks. If saturation is determined in any of the multiple data sets, data obtained by that set need not be utilized in the overall analysis. In any case, simply stated, none of the prior provides for regularly switching a mass spectrometer lens between high and low sensitivity modes in a manner analogous to that of the present invention.

The dependent claims in this application are seen to further distinguish the present invention from the known prior art. Specifically, the exact lens type(s) employed, voltages utilized, ion percentages, sensitivity variances, ion sources, types of mass

analyzer, specified mass-to-charge ratios and number of sensitivity modes covered by the claims are not all seen to be found in the applied prior art. Regardless, given the perceived clear distinctions between the present invention as set forth in the independent claims, the dependent claims will not be discussed individually. Based on the above remarks, it is respectfully requested that the claims be allowed and the application passed to issue. If the Examiner should have any further concerns regarding the allowance of this application, he is cordially invited to contact the undersigned at the number provided below to further expedite the prosecution of this case.

Respectfully submitted,



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